Docket No.   AUS9200400009US1

METHOD AND APPARATUS FOR AUTOMATIC E-MAIL RESPONSE INTERRUPTION BASED ON USER ACTIVITY

BACKGROUND OF THE INVENTION

1.   Technical Field:

The present invention relates generally to an improved data processing system for processing and displaying messages. In particular, the present invention provides an electronic mail messaging system for automatic e-mail response interruption based on user activity.

2.   Description of Related Art:

E-mail allows a person to quickly and easily send textual messages and other information, such as, for example, pictures, sound recordings, and formatted documents electronically to other e-mail users anywhere in the world. An e-mail system typically involves a server-based mail program residing on a server computer to manage the exchange of e-mail messages over one or more networks and a client-based mail program residing on the client to implement a mail box that receives and holds the e-mail messages for a user. Typically, these client-based programs also include a graphical user interface to enable a user to easily and conveniently open and read e-mail messages in addition to creating new e-mail messages.

An e-mail user will typically create a message using an e-mail program running on a computer connected to a

Docket No. AUS9200400009US1

computer network, such as a local area network (LAN), a wide area network (WAN), or the Internet. The message will include an e-mail "address" for the intended recipient. When the user has finished entering the message, the user may "send" the message to the intended recipient. The e-mail program then electronically transmits the message over the computer network. The recipient, using an e-mail program running on the recipient's computer, can then "receive" the message.

One problem with such an e-mail system is that important messages requiring immediate action may overlooked if the recipient is forced to sort through a mass of e-mails. Computer users may be busy at their computer terminals, focused on solving customer problems or writing relevant technical documents or references. As the influx of new e-mail to a recipient may be constant and rapid, it may be difficult for a user, visually scanning the inbox, to quickly identify important e-mail messages. In some cases, a user may receive hundreds of e-mail messages in a single day. Scanning the inbox is subject to user error in skipping or missing a message.

One solution to this identification problem is for the sender to indicate that the message content is important. Currently available e-mail systems employ e-mail flags to convey this critical information to the recipient. For example, an "urgent" flag setting may be used to indicate that an e-mail contains important information. The sender designates a message as urgent by selecting an option in the e-mail client prior to

sending the message to the intended recipient. This
"urgent" designation is appended to the message and
subsequently displayed in an information field associated
with the e-mail. For example, an information field of an
e-mail may be populated with an exclamation mark (!) to
indicate that the message is urgent. Consequently, when
the e-mail is displayed in the inbox, the user may
distinguish this urgent e-mail from other e-mails in the
inbox due to the exclamation mark associated with the
urgent e-mail. However, flag settings merely signify to
the recipient that an e-mail, shown within the inbox,
contains important information and needs to be read. In
addition, current e-mail systems do not provide a clear
indication that a particular response from the recipient
is pending. Thus, current e-mail systems simply allow a
recipient to identify important messages displayed in an
inbox.

Therefore, it would be advantageous to have an
improved method, apparatus, and computer instructions for
indicating to an e-mail recipient that a particular e-
mail is important and requires immediate action by
providing automatic e-mail response interruption based on
user activity. It would further be advantageous to have
a mechanism for providing a clear indication that a
response from the recipient is pending.

Docket No.   AUS9200400009US1

SUMMARY OF THE INVENTION

The present invention provides an e-mail type designation that allows for issuing an automatic e-mail response interruption based on user activity. An e-mail message, having an "interrupt" type designation, is sent from an originator and directed to one or more recipients. The receiving e-mail client filters incoming messages and determines whether the e-mail contains an interrupt designation. If an interrupt designation is found, the e-mail client automatically displays content of the interrupt email and any pending actions required of the recipient in a forefront position in the user interface on the client, such as through a popup window. The display of the interrupt e-mail content may be valid until the recipient has responded to the e-mail or completes the pending action specified in the e-mail. Due to the automatic presentation of the interrupt e-mail, the recipient is able to quickly and easily view critical e-mail messages, as well as complete the e-mail task or questions. The display of the interrupt e-mail content also provides a clear indication that a response from the recipient is still pending.

Furthermore, the use of the interrupt type designation may be controlled based on the sender's authority to issue an interrupt e-mail to a particular recipient. The authority to send an interrupt e-mail to a particular recipient may be predicated on the establishment of an organizational hierarchy based on the user's selection. For example, the user may establish an

Docket No. AUS9200400009US1

organizational hierarchy, wherein the authority to issue
an interrupt e-mail to the user are assigned to
individuals according to a user-defined organizational
hierarchy. Client software may perform a directory
lookup against the sending and receiving users when a
message is delivered. Alternatively, the authority to
issue an interrupt e-mail may be predicated on an
external source, such as a corporate directory. A
corporate directory has inherent properties regarding
organizational structure, such as employee and employer
relationship, manager and subordinate relationship, and
hierarchical relationship.

Docket No. AUS9200400009US1

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

Figure 1 depicts a representation of a network of data processing systems in which the present invention may be implemented;

Figure 2 is a block diagram of a data processing system that may be implemented as a server in accordance with a preferred embodiment of the present invention;

Figure 3 is a block diagram illustrating a data processing system in which the present invention may be implemented;

Figure 4 is a block diagram of an exemplary electronic mail messaging system in accordance with a preferred embodiment of the present invention;

Figure 5 are examples of graphical user interfaces that allow for designating an e-mail message as type "interrupt" in accordance with a preferred embodiment of the present invention;

Figure 6 is an example popup messaging window for indicating the receipt of an important e-mail message in accordance with a preferred embodiment of the present invention;

Docket No. AUS9200400009US1

Figure 7 is a flowchart of a process for issuing an e-mail message of type "interrupt" in accordance with a preferred embodiment of the present invention; and

Figure 8 is a flowchart of a process for handling receipt of an e-mail message of type "interrupt" in accordance with a preferred embodiment of the present invention.

Docket No. AUS9200400009US1

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the figures, **Figure 1** depicts a network of data processing systems in which the present invention may be implemented. Network data processing system **100** is a network of computers in which the present invention may be implemented. Network data processing system **100** contains a network **102**, which is the medium used to provide communications links between various devices and computers connected together within network data processing system **100**. Network **102** may include connections, such as wire, wireless communication links, or fiber optic cables.

In the depicted example, server **104** is connected to network **102** along with storage unit **106**. In addition, clients **108, 110,** and **112** are connected to network **102**. These clients **108, 110,** and **112** may be, for example, personal computers or network computers or personal digital assistants (PDA) devices. In the depicted example, server **104** provides data, such as boot files, operating system images, and applications to clients **108-112.** Clients **108, 110,** and **112** are clients to server **104.** Server **104** may act as an instant messaging server to facilitate the exchange of messages between users at clients, such as clients **108, 110,** and **112.** Network data processing system **100** may include additional servers, clients, and other devices not shown.

In the depicted example, network data processing system **100** is the Internet with network **102** representing a worldwide collection of networks and gateways that use the

Docket No.   AUS9200400009US1

Transmission Control Protocol/Internet Protocol (TCP/IP)
suite of protocols to communicate with one another. At
the heart of the Internet is a backbone of high-speed data
communication lines between major nodes or host computers,
consisting of thousands of commercial, government,
educational and other computer systems that route data and
messages. Of course, network data processing system **100**
also may be implemented as a number of different types of
networks, such as for example, an intranet, a local area
network (LAN), or a wide area network (WAN). **Figure 1** is
intended as an example, and not as an architectural
limitation for the present invention.

Referring to **Figure 2,** a block diagram of a data
processing system that may be implemented as a server,
such as server **104** in **Figure 1,** is depicted in accordance
with a preferred embodiment of the present invention.
Data processing system **200** may be a symmetric
multiprocessor (SMP) system including a plurality of
processors **202** and **204** connected to system bus **206.**
Alternatively, a single processor system may be employed.
Also connected to system bus **206** is memory
controller/cache **208,** which provides an interface to local
memory **209.**   I/O bus bridge **210** is connected to system bus
206 and provides an interface to I/O bus **212.**   Memory
controller/cache **208** and I/O bus bridge **210** may be
integrated as depicted.

Peripheral component interconnect (PCI) bus bridge
214 connected to I/O bus **212** provides an interface to PCI
local bus **216.**   A number of modems may be connected to PCI
local bus **216.**   Typical PCI bus implementations will

support four PCI expansion slots or add-in connectors. Communications links to clients **108-112** in **Figure 1** may be provided through modem **218** and network adapter **220** connected to PCI local bus **216** through add-in boards.

Additional PCI bus bridges **222** and **224** provide interfaces for additional PCI local buses **226** and **228,** from which additional modems or network adapters may be supported. In this manner, data processing system **200** allows connections to multiple network computers. A memory-mapped graphics adapter **230** and hard disk **232** may also be connected to I/O bus **212** as depicted, either directly or indirectly.

Those of ordinary skill in the art will appreciate that the hardware depicted in **Figure 2** may vary. For example, other peripheral devices, such as optical disk drives and the like, also may be used in addition to or in place of the hardware depicted. The depicted example is not meant to imply architectural limitations with respect to the present invention.

The data processing system depicted in **Figure 2** may be, for example, an IBM eServer pSeries system, a product of International Business Machines Corporation in Armonk, New York, running the Advanced Interactive Executive (AIX) operating system or LINUX operating system.

With reference now to **Figure 3,** a block diagram illustrating a data processing system is depicted in which the present invention may be implemented. Data processing system **300** is an example of a client computer. Data processing system **300** employs a peripheral component interconnect (PCI) local bus architecture. Although the

Docket No. AUS920040000009US1

depicted example employs a PCI bus, other bus
architectures such as Accelerated Graphics Port (AGP) and
Industry Standard Architecture (ISA) may be used.
Processor **302** and main memory **304** are connected to PCI
local bus **306** through PCI bridge **308**. PCI bridge **308** also
may include an integrated memory controller and cache
memory for processor **302**. Additional connections to PCI
local bus **306** may be made through direct component
interconnection or through add-in boards. In the depicted
example, local area network (LAN) adapter **310**, SCSI host
bus adapter **312**, and expansion bus interface **314** are
connected to PCI local bus **306** by direct component
connection. In contrast, audio adapter **316**, graphics
adapter **318**, and audio/video adapter **319** are connected to
PCI local bus **306** by add-in boards inserted into expansion
slots. Expansion bus interface **314** provides a connection
for a keyboard and mouse adapter **320**, modem **322**, and
additional memory **324**. Small computer system interface
(SCSI) host bus adapter **312** provides a connection for hard
disk drive **326**, tape drive **328**, and CD-ROM drive **330**.
Typical PCI local bus implementations will support three
or four PCI expansion slots or add-in connectors.

An operating system runs on processor **302** and is used
to coordinate and provide control of various components
within data processing system **300** in **Figure 3**. The
operating system may be a commercially available operating
system, such as Windows XP, which is available from
Microsoft Corporation. An object oriented programming
system such as Java may run in conjunction with the
operating system and provide calls to the operating system

Docket No. AUS9200400009US1

from Java programs or applications executing on data processing system **300**. "Java" is a trademark of Sun Microsystems, Inc. Instructions for the operating system, the object-oriented programming system, and applications or programs are located on storage devices, such as hard disk drive **326,** and may be loaded into main memory **304** for execution by processor **302.**

Those of ordinary skill in the art will appreciate that the hardware in **Figure 3** may vary depending on the implementation. Other internal hardware or peripheral devices, such as flash read-only memory (ROM), equivalent nonvolatile memory, or optical disk drives and the like, may be used in addition to or in place of the hardware depicted in **Figure 3**. Also, the processes of the present invention may be applied to a multiprocessor data processing system.

The depicted example in **Figure 3** and above-described examples are not meant to imply architectural limitations. For example, data processing system **300** also may be a notebook computer or hand held computer in addition to taking the form of a PDA. Data processing system **300** also may be a kiosk or a Web appliance.

The present invention allows an e-mail sender to issue an interrupt e-mail to a recipient. This e-mail message includes an interrupt indicator in the form of either specific content within the subject line of the message, or a tag appended to the message to indicate that the message is designated as a type "interrupt". When an e-mail message is sent to a recipient, the receiving e-mail client filters the message to identify

Docket No. AUS9200400009US1

whether an e-mail contains an interrupt designation. For example, an interrupt designation of "/INTERRUPT" may be placed within the subject line of the e-mail message. If the receiving e-mail client has been configured to filter those messages that contain "/INTERRUPT" within the subject line of the e-mail message, the e-mail client may display the e-mail content not only within the e-mail client, but also display the e-mail content and any pending actions required of the recipient in such a manner as to attract the recipient's attention, such as through a popup window.

In an alternative example, the sender may select a flag option provided on the message interface in order to designate the e-mail as an interrupt e-mail. This interrupt flag may be included in the header or footer of the e-mail. When the receiving e-mail client filters the header or footer of the incoming e-mail, the interrupt tag is detected. As a result, the receiving e-mail client will handle the e-mail as an interrupt e-mail and display the e-mail content and any pending actions required of the recipient in such a manner as to attract the recipient's attention, such as through a popup window.

Due to the presentation of a popup window, a recipient is able to quickly and easily view critical e-mail messages, as well as complete the e-mail task or questions. The e-mail popup window may be valid until the recipient has responded to the e-mail or completes the pending action specified in the e-mail. The popup

Docket No.   AUS9200400009US1

window also provides a clear indication that a response
from the recipient is pending.

In addition, the use of the interrupt type
designation may be controlled based on the sender's
authority to issue an interrupt e-mail to a particular
recipient. A user may establish an organizational
hierarchy, wherein the authority to issue an interrupt e-
mail to the user are assigned to individuals according to
a user-defined organizational hierarchy. Client software
may perform a directory lookup against the sending and
receiving users when a message is delivered.
Alternatively, an external source may be used to provide
an authority list, such as a corporate telephone
directory. A corporate telephone directory has inherent
properties regarding organizational structure, such as
employee and employer relationship, manager and
subordinate relationship, and hierarchical relationship.

Turning now to **Figure 4,** a diagram illustrating an
exemplary electronic mail messaging system **400** is
depicted in accordance with a preferred embodiment of the
present invention. In this example, e-mail client **402,**
e-mail client **404,** and e-mail client **406** are e-mail
clients, programs, or applications located at different
client data processing systems, such as client **108,**
client **110,** and client **112** in **Figure 1.** Message file
408, message file **410,** and message file **412** are
associated with these e-mail clients. These message
files serve to store e-mail messages received by the
clients and may be organized into various mailboxes.
Examples of various mailboxes include, for example, an in

folder, a sent folder, a deleted folder, and an outbox folder.

These e-mail programs may employ different protocols depending upon the implementation. For example, simple mail transfer protocol (SMTP) is a standard e-mail protocol that is based on TCP/IP. This protocol defines a message format and the message transfer agent, which stores and forwards the mail. Other protocols, such as post office protocol 3 (POP3), also may be employed.

These e-mail programs are used to send e-mail back and forth to different users through e-mail server **414**. Messages sent to other e-mail clients are stored in e-mail message database **416**. When an e-mail client connects to e-mail server **414**, any messages for that particular client are then sent to the client.

E-mail clients **402, 404,** and **406** may be implemented using presently available e-mail clients with an additional process or feature in which these clients now look for e-mail type designation as described above.

Turning next to **Figure 5,** an exemplary e-mail messaging window that allows for designating an e-mail message as type "interrupt" is depicted in accordance with a preferred embodiment of the present invention. The components illustrated in **Figure 5** may be found in an e-mail client, such as e-mail client **402, 404,** or **406** in **Figure 4.** These components may be implemented in a data processing system, such as data processing system **300** in **Figure 3.**

When a user wants to issue an e-mail, a messaging window, such as message window **500** shown in **Figure 5,** may

be created.   The upper portion of the e-mail messaging window typically, but not necessarily, contains various administration information **502** regarding the e-mail, such as the recipients of the message (TO: field **504** and CC: field **506**) and subject line **508**.   Following administration information **502** is the text **510** of the e-mail message, and may contain various inquiries/questions or other types of solicitation that the sender is asking or requesting of the recipient.   For example, in this e-mail message there are inquiries of "What were the defects found for the problem relating to close waits?" and "Can you give me an analysis of potential solutions?"   Also, the e-mail message includes a directive of "Review the following documents and determine if they have any value to helping the customer."   The present invention allows a user to designate an e-mail as an interrupt e-mail prior to sending the e-mail to a recipient. Accordingly, the user may include an indicator in subject line **508** of the e-mail to allow a recipient e-mail system to identify that the e-mail is an interrupt e-mail.   For example, the indicator "/INTERRUPT" may be included subject line **508**, such that subject line **508** now reads, "/INTERRUPT Defect 1010 update requested".   The e-mail message may then be sent to the intended recipients with the included interrupt indicator.

Another method of including an interrupt indicator within an e-mail message is using a selectable flag in an existing e-mail system, such as urgent flag option **512**. Rather than populating the subject line with an interrupt indicator, the user may select urgent flag option **512**

Docket No. AUS9200400009US1

prior to sending the e-mail to designate the e-mail as an interrupt e-mail. The e-mail system software may be modified to attach a tag to the header or footer of the e-mail message when urgent flag option **512** is selected, such that a receiving e-mail system may detect that the incoming e-mail message is an interrupt e-mail. The e-mail message may then be sent to the intended recipients with the attached interrupt indicator.

It should be noted that the selectable flag option in **Figure 5** may also be a flag specially created as an interrupt flag, so as to provide the sender with an another level of e-mail designation type in addition to the urgent flag option.

With reference now to **Figure 6,** an example popup messaging window for indicating the receipt of an important e-mail message is depicted in accordance with a preferred embodiment of the present invention. Popup window **600** is presented for purposes of illustration and not meant as a limitation as to how messages may be presented. Popup window **600** is displayed when an interrupt e-mail message is received from another user.

In this example, popup window **600** is a messaging window displaying content **602** of the interrupt e-mail, including any pending actions required by the recipient. Although popup window **600** is illustrated as displaying the entire content of the e-mail, it should be noted that only a portion of the e-mail may be shown in popup window **600**, such as, for example, the subject line. In this situation, the recipient is directed to the recipient's inbox, wherein the entire e-mail message may be viewed.

Docket No. AUS9200400009US1

When an interrupt e-mail is received at an e-mail
client, such as e-mail client **402** in **Figure 4,** the e-mail
client detects this type of e-mail and immediately
displays the content of the e-mail in a popup window,
such as popup window **600.** Popup window **600** is brought to
a forefront position of the user interface, and remains
active in these illustrative examples until the user
completes the e-mail inquiry or requested action by
responding to the e-mail or by completing the requested
task specified in the e-mail.

Popup window **600** may also include quick-reply
buttons, such as reply button **604** and action completed
button **606.** Selecting reply button **604** may result in the
generation of a reply message window, through which the
recipient of the interrupt e-mail may respond to the
sender. Selecting action completed button **606** may result
in an automatic e-mail being sent back to the interrupt
e-mail sender in order to notify the sender that the
recipient has completed the action specified in the e-
mail.

Note that popup window **600** preferably does not
include a "close" button. Popup window **600** may be closed
by replying to the sender or by completing the action
specified in the e-mail. By preventing the recipient
from closing popup window **600,** the present invention may
provide a clear indication that a particular response
from the recipient is still pending.

Thus, as described above, instead of marking an e-
mail message as important and having the important
message placed in the recipient's inbox with other

19

Docket No. AUS9200400009US1

incoming messages where is may be overlooked or ignored,
a popup window is displayed at the forefront of the
recipient's desktop for an e-mail message designated as
an interrupt e-mail. Various popup window displays may
be used to differentiate messages of type interrupt from
other normal messages in order to draw the user's
attention to these important messages. In this manner, a
user may easily be informed of messages that require
immediate action than others received during an instant
message session.

Turning next to **Figure 7**, a flowchart of a process
for issuing an e-mail message of type "interrupt" is
depicted in accordance with a preferred embodiment of the
present invention. The process illustrated in **Figure 7**
may be implemented in an e-mail messaging system, such as
e-mail system **400** in **Figure 4**.

The process begins by generating a new e-mail
message (step **702**). Next, the sender designates the new
e-mail message as an interrupt e-mail (step **704**). An e-
mail may be designated as an interrupt e-mail by using an
indicator in the form of either specific content within
the subject line of the message, or a tag appended to the
message to indicate that the message is designated as a
type "interrupt". For example, the sender may designate
an e-mail as an interrupt e-mail by including an
interrupt indicator, such as "/INTERRUPT", within the
subject line of the message. Alternatively, a menu
option may be provided to the sender. When the menu
option is selected, this results in the message being
designated as an interrupt e-mail through a tag attached

to the header or footer of the message. The e-mail client then sends the e-mail to the intended recipients (step **706**).

As mentioned previously, when an e-mail message is sent to a recipient, the receiving e-mail client filters the message to identify whether an e-mail contains an interrupt designation. If the receiving e-mail client determines that the incoming e-mail is an interrupt e-mail, the e-mail client automatically displays the content of the interrupt e-mail message and any pending actions required of the recipient, such as through a popup window.

For example, if an interrupt designation is placed within the subject line of the e-mail message and the receiving e-mail client has been configured to filter those messages that contain a specific interrupt designation within the subject line, the e-mail client may generate a popup window containing the e-mail content and any pending actions required of the recipient.

In an alternative example, the sender may select a flag option provided on the message interface in order to designate the e-mail as an interrupt e-mail. This interrupt flag may be attached to the header or footer of the e-mail. When the receiving e-mail client filters the header or footer of the incoming e-mail, the interrupt tag is detected. As a result, the receiving e-mail client handles the e-mail as an interrupt e-mail and generates a popup window containing the e-mail content and any pending actions required of the recipient message.

Docket No. AUS9200400009US1

In some circumstances, however, it may be desirable to limit the ability to issue an interrupt e-mail. The use of the interrupt type designation may be controlled based on the sender's authority to issue an interrupt e-mail to a particular recipient. The authority to send an interrupt e-mail to a particular recipient may be predicated on the establishment of an organizational hierarchy based on a user's selection or on an external list, such as a corporate telephone directory. A directory look-up using the organizational hierarchy is performed to determine the relationship of the sender and recipients when an e-mail message is generated. From the hierarchy relationship, it may be determined whether the sender may issue an interrupt e-mail to a particular recipient.

In an illustrative embodiment, an employee's superior, such as a manager, may be granted the authority issue an interrupt e-mail to the employee. In a similar fashion, the employee's peers may be able to issue interrupt e-mails to the employee. However, the employee may not be granted the authority to send an interrupt e-mail to a manager, since the manager is higher in the organizational hierarchy of the corporation. Thus, the use of interrupt e-mails may be controlled based on the hierarchical relationship between the sender and recipient.

Turning next to **Figure 8**, a flowchart of a process for handling receipt of an e-mail message of type "interrupt" is depicted in accordance with a preferred embodiment of the present invention. The process

22

Docket No. AUS9200400009US1

illustrated in **Figure 8** may be implemented in an e-mail
messaging system, such as e-mail system **400** in **Figure 4.**

The process begins by receiving a new e-mail message
(step **802**). The receiving e-mail client then analyzes the
type designation of the incoming message and determines
if the message is an interrupt e-mail (step **804**). The e-
mail client may determine if the message is an interrupt
e-mail by implementing filtering procedures present in
existing e-mail system. For example, the e-mail client
may be configured to filter on the contents of the
subject line. Thus, if the subject line included an
interrupt designation, the e-mail client may distinguish
incoming interrupt e-mails from normal e-mails.
Alternatively, the e-mail client may check the header or
footer of the incoming e-mail message for a tag that
indicates that the message is an interrupt e-mail. These
filtering techniques may be used alone or in combination
in order to differentiate important e-mails from normal
e-mails. If it is determined that the e-mail message is
not an interrupt e-mail, the message is accepted by the
receiving e-mail client and displayed in the messaging
window of the e-mail client in a normal manner (step
806).

Turning back to step **804**, if the e-mail type is
determined to be an interrupt e-mail, a determination is
made whether the sender has the authority to issue such
an e-mail to the particular recipient (step **808**). This
step is performed in order to establish the hierarchical
relationship of the e-mail participants. The e-mail
client may perform a directory lookup to identify the

relationship of the sender and recipient. Based on the
relationship, it may be determined whether the sender has
the authority to issue an interrupt e-mail to the
recipient. For example, if the employee's manager sends
an interrupt e-mail to the employee, then the receiving
e-mail client determines that the relationship is such
that it handles the e-mail as an interrupt e-mail.
However, if the employee sends an interrupt e-mail is the
employee's manager, the receiving e-mail client
determines that the employee does not have the authority
to issue an interrupt e-mail to the manager and handles
the e-mail in a normal fashion.

Thus, if it is determined that the sender does not
have appropriate authority to issue an interrupt e-mail
to the recipient, the message is accepted by the
receiving e-mail client and displayed in the inbox of the
e-mail client in a normal manner (step **806**).

If it is determined that the sender may issue
interrupt e-mails to the recipient, a determination is
then made as to whether the desktop is active (step **810**).
For example, if the user is currently working on the
computer, it is presumed that the desktop is active. In
contrast, the desktop is inactive if the user steps away
from the computer for a period of time and/or if the user
"locks" the computer until the user returns. If it is
determined that the desktop is active, the e-mail client
automatically displays the content of the e-mail on the
client and displays this content in a forefront position
of the user interface (step **814**). This content display,
such as through a popup window, may contain the e-mail

Docket No.   AUS9200400009US1

message content and any pending action required of the
recipient. By employing this interrupt e-mail system,
the recipient is immediately notified of important
messages and may perform the requested action without
delay.

Furthermore, the e-mail client may continue to
display the interrupt e-mail content on the desktop until
the recipient has responded to the e-mail or completed
the pending action specified in the e-mail (step **816**).
For example, although the recipient may maneuver around a
popup window containing the interrupt e-mail (e.g., move
another program to a forefront position of the user
interface), the recipient may not terminate the popup
window without performing the requested action in the e-
mail or responding to the e-mail. In this manner, the
present invention may force the recipient to perform the
action specified in the interrupt e-mail, as well as
providing a clear indication that a response from the
recipient is still pending.

If it is determined that the desktop is inactive,
the display of the interrupt e-mail content may be
delayed until the desktop is active (step **812**).

Thus, the present invention provides an e-mail
designation mechanism that allows for automatic e-mail
response interruption based on user activity. The
present invention provides an advantage over existing e-
mail system by allowing an authorized sender to issue an
interrupt e-mail to a recipient in order to bring an
important message to the attention of a recipient. In
addition, the mechanism of the present invention requires

Docket No.   AUS9200400009US1

the recipient to act upon the interrupt e-mail before
being allowed to terminate the automatic e-mail content
display. In this manner, critical e-mails and the
pending status of the required action may be conveyed to
a recipient.

The mechanism of the present invention allows a
sender to issue an e-mail message having an interrupt
type designation to one or more recipients. The
receiving e-mail client filters incoming messages and
determines whether an e-mail contains an interrupt
designation. If an interrupt designation is found, the
e-mail client automatically displays content of the
interrupt e-mail and any pending actions required of the
recipient, such as through a popup window. This
interrupt e-mail content display may be valid until the
recipient has responded of completes the pending action
specified in the e-mail. Due to the automatic interrupt
e-mail display, the recipient is able to quickly and
easily view critical e-mail messages, as well as complete
the e-mail task or questions.

Furthermore, the use of the interrupt type
designation may be controlled based on the sender's
authority to issue an interrupt e-mail to a particular
recipient. The authority to send an interrupt e-mail to
a particular recipient may be predicated on the
establishment of an organizational hierarchy based on the
user's selection. Client software may perform a
directory lookup against the sending and receiving users
when a message is delivered. Alternatively, the

authority to override settings may be predicated on an external source, such as a corporate telephone directory.

It is important to note that while the present invention has been described in the context of a fully functioning data processing system, those of ordinary skill in the art will appreciate that the processes of the present invention are capable of being distributed in the form of a computer readable medium of instructions and a variety of forms and that the present invention applies equally regardless of the particular type of signal bearing media actually used to carry out the distribution. Examples of computer readable media include recordable-type media, such as a floppy disk, a hard disk drive, a RAM, CD-ROMs, DVD-ROMs, and transmission-type media, such as digital and analog communications links, wired or wireless communications links using transmission forms, such as, for example, radio frequency and light wave transmissions. The computer readable media may take the form of coded formats that are decoded for actual use in a particular data processing system.

The description of the present invention has been presented for purposes of illustration and description, and is not intended to be exhaustive or limited to the invention in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art. The embodiment was chosen and described in order to best explain the principles of the invention, the practical application, and to enable others of ordinary skill in the art to understand the invention for

Docket No. AUS9200400009US1

various embodiments with various modifications as are
suited to the particular use contemplated.